REMARKS

Claims 1-32 are pending in the present Application. Claim 2 has been canceled and claim 1 has been amended, leaving claims 1 and 3-32 for consideration upon entry of the present Response. No new matter has been added by this amendment. Reconsideration and allowance of the claims are respectfully requested in view of the above amendment and following remarks.

Claim Amendment

Claim 1 has been amended to contain the limitation of claim 2 as originally filed.

Claim Rejections Under 35 U.S.C. § 103(a)

Claims 1 and 4 - 6 stand rejected under 35 U.S.C. § 103(a), as allegedly unpatentable over Rosato's Injection Molding Handbook (3rd ed.; hereinafter the "Rosato").

For an obviousness rejection to be proper, the Examiner must meet the burden of establishing a *prima facie* case of obviousness, i.e., that all elements of the invention are disclosed in the prior art; that the prior art relied upon, coupled with knowledge generally available in the art at the time of the invention, contain some suggestion or incentive that would have motivated one of ordinary skill in the art to modify a reference or combined references; and that the proposed modification of the prior art had a reasonable expectation of success, determined from the vantage point of the skilled artisan at the time the invention was made. *In re Fine*, 5 U.S.P.Q.2d 1596, 1598 (Fed. Cir. 1988); *In Re Wilson*, 165 U.S.P.Q. 494, 496 (C.C.P.A. 1970); *Amgen v. Chugai Pharmaceuticals Co.*, 927 U.S.P.Q.2d, 1016, 1023 (Fed. Cir. 1996).

Claim 1 as amended is directed to a method of molding a disk comprising injection molding a polymeric material at a melt temperature of about 330 to about 370°C into a mold having a mold temperature of about 90 to about 130°C and a clamp tonnage of about 12 to about 35 tons to form a disk, and furthermore wherein a disk assembly fabricated from the disk exhibits a radial tilt change value after 96 hours at 80°C of less than or equal to about 0.35 degree measured at a radius of 55 millimeters. As provided in the Specification as filed,

molded-in stresses in a molded article, especially disks and disk substrates, may be significantly reduced by carefully choosing the particular molding conditions used to mold the article. Application, [0011]. It has been unexpectedly found that certain molding parameters, such as mold temperature and melt temperature, can affect the quality of a disk substrate in terms of its physical stability or feature replication during molding. Application, [0011].

Rosato fails to render obvious claim 1 as amended for two reasons. First, Rosato fails to teach or suggest the select combination of molding parameters required by the claim. The Rosato reference does not provide one of ordinary skill in the art with a reasonable expectation of obtaining the claimed process as the reference is *overly general*. The general description of Rosato, which provides only vastly varied melt temperatures, mold temperatures, and clamp tonnage for a wide range of polymers, would not lead the artisan to the claimed process as such a vast selection provides no motivation for selecting the particular parameters to result in the process of independent claim 1.

The Applicants respectfully contend that the Examiner is not considering the claim "as a whole" when she indicates

> Applicant contends that there is no motivation to combine Rosato's specific temperature disclosures (as discussed above) with a certain clamp tonnage. This is not persuasive because the examiner maintains that clamp tonnage *is* a result-effective variable that is easily optimized and determined through experimentation.

Office Action, 7-11-06, page 14 (emphasis in the original). The Applicants respectfully assert that it is the particular combination of the required melt temperature, mold temperature, and clamp tonnage that has not been rendered obvious. By picking and choosing disparate teachings of Rosato followed with an 'obvious to try' conclusion for clamp tonnage, the Applicants believe the invention as a whole has not been properly considered.

Secondly, Rosato fails to teach or suggest the requisite property of the disk assembly, prepared from the molded disks of the method, wherein the assembly exhibits a select radial tilt change value required by the claim. The disk, once prepared into a disk assembly, is

required to meet a stringent radial tilt change value under stress conditions. This requirement is not taught or suggested by Rosato. Accordingly, reconsideration and removal of the rejections to independent claim 1 and dependent claims 4-6 are respectfully requested.

Claims 2, 3, 15, 16, 18-21, 24, 31, and 32 stand rejected under 35 U.S.C. § 103(a), as allegedly unpatentable over Rosato, in view of Japanese Patent No. JP 10-306268 to Toshihiko, et al (hereinafter the "Toshihiko"). Applicants respectfully traverse this rejection.

Toshihiko is directed to an adhesive composition used in recording media and generally discloses a method of producing an information record medium such as by injection molding. However, this reference does not disclose molding parameters, such as melt temperature, mold temperature, and clamp tonnage, at all.

Regarding independent claim 1, from which claims 3 and 15-16 depend, Rosato fails to teach or suggest the particular combination of the melt temperature, mold temperature, and clamp tonnage of the instant claim for the reasons presented above. Additionally, Toshihiko does not cure this deficiency as this reference fails to even teach these molding parameters, let alone the unique combination of these parameters.

Toshihiko does disclose the prevention of the curvature of a disk assembly by use of a particular adhesive. Toshihiko, [0006] and [0058]. The Examiner has stated in the Office Action that "[i]t would have been prima facie obvious to one of ordinary skill in the art at the time the invention was made to use Toshihiko's radial tilt change value as a parameter of Rosato's molding process in order to accurately form an article that must meet strict end-use specifications." Office Action, 7-11-06, page 3. The Applicants respectfully disagree. It is Toshihiko's adhesive that is taught to control disk curvature, *not molding parameters*. One of ordinary skill in the art would not be motivated to combine Rosato and Toshihiko to result in the claimed invention, particularly since Toshihiko controls disk curvature *with adhesive* and not by any special molding conditions. Furthermore, Toshihiko fails to provide a teaching or suggestion of select molding conditions from the vast ranges disclosed in Rosato to form a disk that would provide the claimed property of radial tilt change value of a resulting disk assembly. Additionally, one of ordinary skill in the art would have no

expectation of success for using the particular molding conditions of Rosato to achieve a disk assembly having reduced radial tilt value since neither references teaches or suggests this result.

Regarding independent claim 18, Rosato and Toshihiko have not rendered the instant claim obvious as the references fail to teach or suggest all of the limitations of the claim. Claim 18 is directed to a multi-step method of molding disks including injection molding a polymeric material to form disks according to a molding model, testing disk assemblies for radial tilt change, creating an updated molding model, and repeating the molding, testing and creating steps to form final disks and a final molding model.

Rosato only generally discloses broad molding parameters. However, the reference fails to provide the requisite teaching or suggestion to injection mold according to a molding model comprising certain parameters, testing the resulting disks, updating the molding model, and repeating until the molding parameters of the resulting molding model results in the fabrication of disk assemblies exhibiting a radial tilt change value after aging of less than or equal to about 0.35 degree measured at a radius of 55 millimeters. Toshihiko also fails to teach any melt temperature, mold temperature, and clamp tonnage, let alone a multi-step method of molding disks according to a molding model.

The Examiner alleged in Response to Argument that Toshihiko's "repeated research" would include multi-step processes and thus would have rendered instant claim 18 obvious Office Action 7-11-06, page 5. Applicants respectfully disagree, as Toshihiko's "repeated research" would not provide suggestion or motivation for one of ordinary skill in the art to arrive at the multi-step method of the instant claim 18. Toshihiko's repeated research has nothing to do with injection molding disks to result in disk assemblies having reduced radial tilt change values. It is particularly noted that Toshihiko fails to disclose any molding parameters whatsoever. Toshihiko, rather, is directed to use of particular adhesives to provide record media having good curvature properties. Based on the teachings of Rosato and Toshihiko, one of ordinary skill in the art would not even look to molding parameters as the means to obtain a disk assembly having reduced radial tilt as neither of these references

teach or suggest the importance of these parameters to final disk assembly dimensional stability.

As Rosato or Toshihiko, either taken alone or combined, fails to teach or suggest all elements of independent claim 18, this claim and its dependent claims 19-21, 24, 31 and 32 have not been rendered obvious.

Applicants respectfully request withdrawal of the 35 U.S.C. §103(a) rejections against claims 2, 3, 15, 16, 18-21, 24, 31, and 32.

Claims 7 and 8 stand rejected under 35 U.S.C. § 103(a), as allegedly unpatentable over Rosato, in view of U.S. Patent No. 6,221,536 to Dhar, et al (hereinafter the "Dhar"). Applicants respectfully traverse this rejection.

Both claims 7 and 8 depend from claim 1 and further define the disk as having a certain percent feature replication. As mentioned in the Specification of the instant application at paragraph [0017], the percent feature replication is based on a comparison of the measurements of the mold stamper features with the measurements of the matching features of the disk that is molded.

Dhar generally discloses a material containing a polymerizable monomer or oligomer, where the material exhibits shrinkage compensation upon polymerization. The material is used to make recording media. Dhar does not disclose molding parameters, such as melt temperature, mold temperature, and clamp tonnage.

For reasons presented above, claim 1 is not obvious over Rosato as Rosato fails to suggest or motivate one of ordinary skill in the art to modify the teachings therein to arrive at the particular combination of the melt temperature, the mold temperature and the clamp tonnage as required in claim 1, and Rosato fails to teach or suggest the radial tilt value requirement of the claim. Dhar fails to cure the deficiency of Rosato as Dhar does not even disclose melt temperature, mold temperature, and clamp tonnage, let alone molding disks using the particular molding parameters of the instant claim 1. Dhar, furthermore, fails to teach or suggest the required radial tilt value required by claim 1. Based on the teachings of Rosato and Dhar, one of ordinary skill in the art would not even look to molding parameters

as the means to obtain a disk assembly having reduced radial tilt or good percent feature replication as neither of these references teach or suggest the importance of molding parameters for either feature replication or for final disk assembly dimensional stability.

Accordingly, Applicants respectfully request withdrawal of the 35 U.S.C. §103(a) rejections regarding claims 7 and 8.

Claims 9, 10, and 14 stand rejected under 35 U.S.C. § 103(a), as allegedly unpatentable over Rosato, in view of U.S. Publication No. 2002/0137840 to Adedeji, et al (hereinafter the "Adedeji"). Applicants respectfully traverse this rejection.

Claims 9, 10, and 14 all ultimately depend from claim 1 and further define the polymeric material used to mold a disk.

Adedeji generally discloses a thermoplastic composition including specified amounts of a poly(arylene ether), a homopolymer of an alkenyl aromatic monomer, a polyolefin, a hydrogenated block copolymer, and an unhydrogenated block copolymer, but the composition is substantially free of any rubber-modified poly(alkenyl aromatic) resin.

For reasons presented above, claim 1 is not obvious over Rosato as Rosato fails to suggest or motivate one of ordinary skill in the art to modify the teachings therein to arrive at the particular combination of the melt temperature, the mold temperature and the clamp tonnage as required in claim 1 as well as the required radial tilt change value of disk assemblies fabricated by the disk. Adedeji fails to cure the deficiency of Rosato as Adedeji does not provide the missing teaching, suggestion, or motivation. In fact, Adedeji does not even disclose molding parameters, such as melt temperature, mold temperature, and clamp tonnage for molding disks using the particular molding parameters of the instant claim. Adedeji also does not teach or suggest molding disks to have the required radial tilt change value when prepared into disk assemblies. Since Adedeji in combination with Rosato fail to suggest or motivate one of ordinary skill in the art to modify the teachings therein to result in the particular combination of the melt temperature, the mold temperature and the clamp tonnage as required in claim 1, and further fails to teach or suggest the radial tilt change

value, claim 1 and its dependent claims 9, 10, and 14 have not been rendered obvious over Rosato in view of Adedeji.

Accordingly, Applicants respectfully request withdrawal of the 35 U.S.C. §103(a) rejections regarding claims 9, 10, and 14.

Claim 11 stands rejected under 35 U.S.C. § 103(a), as allegedly unpatentable over Rosato and U.S. Patent No. 6,407,200 to Singh, et al. (hereinafter the "Singh"), further in view of U.S. Patent No. 6,306,953 to Fortuyn, et al. (hereinafter the "Fortuyn"). Applicants respectfully traverse this rejection.

Singh is generally directed to a method of preparing a poly(arylene ether) including oxidatively polymerizing a monohydric phenol in solution, concentrating the solution by removing a portion of the solvent to form a concentrated solution having a cloud point, T_{cloud}, and combining the concentrated solution with an anti-solvent to precipitate the poly (arylene ether), wherein the concentrated solution has a temperature of at least about (T_{cloud} -10°C) immediately before it is combined with the anti-solvent. Singh does not teach injection molding parameters or radial stability parameters of disk assemblies.

Fortuyn is generally directed to reduced emissions of styrene and butanal by thermoplastic compositions comprising poly(arylene ether), a polystyrene resin, optionally rubber, and an activated carbon derived from vegetable matter.

Claim 11 ultimately depends from claim 1. As presented above, claim 1 is not obvious over Rosato. Neither Singh nor Fortuyn cure the deficiency of Rosato as these references do not provide the missing teaching, suggestion, or motivation. Based on the teachings of Rosato, Singh, and Fortuyn, one of ordinary skill in the art would not even look to molding parameters as the means to obtain a disk assembly having reduced radial tilt as neither of these references teach or suggest the importance of these parameters to final disk assembly dimensional stability.

Accordingly, Applicants respectfully request withdrawal of the 35 U.S.C. §103(a) rejection regarding claim 11.

Claim 12 stands rejected under 35 U.S.C. § 103(a), as allegedly unpatentable over Rosato and Singh, further in view of U.S. Patent No. 4,727,093 to Allen, et al. (hereinafter the "Allen"). Applicants respectfully traverse this rejection.

Allen generally discloses low density particles or beads of polyphenylene ether or polyphenylene ether-polystyrene blends provided by incorporation of a suitable blowing agent such as pentane into the resin mixture, flowed by expansion of the resin particles by exposure temperatures near the Tg of the blend. Allen does not teach injection molding parameters or disk assembly dimensional stability.

Claim 12 ultimately depends from claim 1. As presented above, claim 1 is not obvious over Rosato in view Singh. Allen also fails to cure the deficiency of Rosato and Singh as this reference does not provide the missing teaching, suggestion, or motivation. Based on the teachings of Rosato, Singh, and Allen, one of ordinary skill in the art would not even look to molding parameters as the means to obtain a disk assembly having reduced radial tilt as neither of these references teach or suggest the importance of these parameters to final disk assembly dimensional stability.

Accordingly, Applicants respectfully request withdrawal of the 35 U.S.C. §103(a) rejection regarding claim 12.

Claim 13 stands rejected under 35 U.S.C. § 103(a), as allegedly unpatentable over Rosato and Singh, further in view of U.S. Patent No. 5,872,201 to Cheung, et al (hereinafter the "Cheung"). Applicants respectfully traverse this rejection.

Cheung generally discloses substantially random interpolymers comprising (1) ethylene, (2) one or more aromatic vinylidene monomers or hindered aliphatic or cycloaliphatic vinylidene monomers, and (3) one or more olefinic monomers having from 3 to about 20 carbon atoms. Cheung does not disclose specific injection molding parameters or disk assembly dimensional stability.

Claim 13 ultimately depends from claim 1. As presented above, claim 1 is not obvious over Rosato in view Singh. Cheung also fails to provide the missing teaching or suggestion to modify the teachings of the references to achieve the particular molding

parameters and radial tilt value as required by claim 1. Based on the teachings of Rosato, Singh, and Cheung, one of ordinary skill in the art would not even look to molding parameters as the means to obtain a disk assembly having reduced radial tilt as neither of these references teach or suggest the importance of these parameters to final disk assembly dimensional stability. Accordingly, Applicants respectfully request withdrawal of the 35 U.S.C. §103(a) rejection regarding claim 13.

Claim 17 stands rejected under 35 U.S.C. § 103(a), as allegedly unpatentable over Rosato, in view of U.S. Patent No. 5,286,812 to Karasz, et al. (hereinafter the "Karasz"). Applicants respectfully traverse this rejection.

Karasz generally discloses thermoplastic compositions of an aromatic polyimide and an aromatic polyethersulfone. Blends of poly(2,6-dimethyl-1,4-phenylene oxide) is briefly disclosed as a miscible blend. Karasz does not disclose specific injection molding parameters.

Claim 17 is directed to a method of molding a disk, comprising injection molding a polymeric material at a melt temperature of about 330 to about 370°C into mold having a mold temperature of about 90 to about 130°C and a clamp tonnage of about 12 to about 35 tons to form a disk, wherein the polymeric material comprises poly(2,6-dimethyl-1,4-phenylene oxide) and polystyrene. For similar reasons that claim 1 is not obvious over Rosato, claim 17 is not obvious over Rosato because Rosato fails to teach or suggest the specified combination of the melt temperature, the mold temperature and the clamp tonnage, and especially as required for poly(2,6-dimethyl-1,4-phenylene oxide) and polystyrene in claim 17. Karasz also fails to teach or suggest the particular molding parameter combination. Karasz does not even disclose any melt temperature, mold temperature, and clamp tonnage.

It has been found that by careful selection of molding parameters, disks can be prepared having reduced molded-in stresses. Application, [0011]. Molding parameters such as mold temperature and melt temperature can significantly affect the quality of a disk substrate in terms of its physical stability, and careful choice of these molding conditions results in a molded disk substrate having increased dimensional stability. Application, Table

1 and [0057]. The molding parameters also have a significant effect on the disk's feature replication as well. Application, [0011].

The Rosato reference does not provide one of ordinary skill in the art with a reasonable expectation of obtaining the claimed process as the reference does not teach or suggest the claimed molding parameters for poly(2,6-dimethyl-1,4-phenylene oxide) and polystyrene. Indeed, the average melting temperatures for polystyrene ("PS") and polyphenylene oxide ("PPO") disclosed in Table 4-8 of Rosato are 100°C and 120°C, respectively. These temperatures are significantly lower than the required temperatures of about 330°C to about 370°C of claim 17. Accordingly, one of ordinary skill in the art would be motivated to use a significantly lower melt temperature and move away from the melt temperatures claimed. As Rosato teaches away from the claimed invention, the Applicants respectfully request withdrawal of the 35 U.S.C. §103(a) rejection regarding claim 17.

Claim 22 stands rejected under 35 U.S.C. § 103(a), as allegedly unpatentable over Rosato and Toshihiko, further in view of U.S. Patent No. 5,525,645 to Ohkawa, et al. (hereinafter the "Ohkawa"). Applicants respectfully traverse this rejection.

Ohkawa generally discloses a resin composition for optical molding which comprises (a) an actinic radical-curable and cationically polymerizable organic substance and (b) an actinic radiation-sensitive initiator for cationic polymerization. Ohkawa does not teach or suggest injection molding parameters.

Claim 22 depends from claim 18, which is not obvious over Rosato in view Toshihiko as previously discussed. Rosato only generally discloses broad molding parameters. However, as mentioned, Rosato and Toshihiko fail to provide the requisite teaching or suggestion to injection mold according to a molding model comprising certain parameters, testing the resulting disks, updating the molding model, and repeating until the molding parameters of the resulting molding model results in the fabrication of disk assemblies exhibiting a radial tilt change value after aging of less than or equal to about 0.35 degree measured at a radius of 55 millimeters. Furthermore, Ohkawa does not even teach or suggest injection molding, let alone radial tilt of a disk. Based on the teachings of Rosato,

Toshihiko and Ohkawa, one of ordinary skill in the art would not even look to molding parameters as the means to obtain a disk assembly having reduced radial tilt as neither of these references teach or suggest the importance of these parameters to final disk assembly dimensional stability.

Accordingly, Applicants respectfully request withdrawal of the 35 U.S.C. §103(a) rejection against claim 22.

Claim 23 stands rejected under 35 U.S.C. § 103(a), as allegedly unpatentable over Rosato, Toshihiko, and Ohkawa, further in view of Dhar. Applicants respectfully traverse this rejection.

Claim 23 ultimately depends from claim18. As presented above, claim 18 is not obvious over Rosato, Toshihiko, and Ohkawa. Dhar also fails to teach or suggest a multi-step method of molding disks or the required radial tilt value. Based on the teachings of Rosato, Toshihiko, Ohkawa and Dhar, one of ordinary skill in the art would not even look to molding parameters as the means to obtain a disk assembly having reduced radial tilt as neither of these references teach or suggest the importance of these parameters to final disk assembly dimensional stability.

Accordingly, Applicants respectfully request withdrawal of the 35 U.S.C. §103(a) rejection regarding claim 23.

Claims 25-27 stand rejected under 35 U.S.C. § 103(a), as allegedly unpatentable over Rosato and Toshihiko, further in view of Singh. Applicants respectfully traverse this rejection.

Claims 25-27 ultimately depend from claim 18. As presented above, claim 18 is not obvious over Rosato and Toshihiko. Singh also fails to teach or suggest a multi-step method of molding disks according to molding parameters and also fails to teach or suggest the required radial tilt change value. Based on the teachings of Rosato, Toshihiko, and Singh, one of ordinary skill in the art would not even look to molding parameters as the means to obtain a disk assembly having reduced radial tilt as neither of these references teach or

suggest the importance of these parameters to final disk assembly dimensional stability.

Accordingly, Applicants respectfully request withdrawal of the 35 U.S.C. §103(a) rejections regarding claim 25-27.

Claim 28 stands rejected under 35 U.S.C. § 103(a), as allegedly unpatentable over Rosato, Toshihiko, and Singh, further in view of Fortuyn. Applicants respectfully traverse this rejection.

Claim 28 ultimately depends from claim18. As presented above, claim 18 is not obvious over Rosato, Toshihiko, and Singh. Fortuyn also fails to teach or suggest a multi-step method of molding disks and also fails to teach or suggest the required radial tilt change value. Based on the teachings of Rosato, Toshihiko, Singh, and Fortuyn, one of ordinary skill in the art would not even look to molding parameters as the means to obtain a disk assembly having reduced radial tilt as neither of these references teach or suggest the importance of these parameters to final disk assembly dimensional stability. Accordingly, Applicants respectfully request withdrawal of the 35 U.S.C. §103(a) rejection regarding claim 28.

Claim 29 stands rejected under 35 U.S.C. § 103(a), as allegedly unpatentable over Rosato, Toshihiko, and Singh, further in view of Allen. Applicants respectfully traverse this rejection.

Claim 29 ultimately depends from claim18. As presented above, claim 18 is not obvious over Rosato, Toshihiko, and Singh. Allen also fails to teach or suggest a multi-step method of molding disks and also fails to teach or suggest the required radial tilt change value. Based on the teachings of Rosato, Toshihiko, Singh, and Allen, one of ordinary skill in the art would not even look to molding parameters as the means to obtain a disk assembly having reduced radial tilt as neither of these references teach or suggest the importance of these parameters to final disk assembly dimensional stability. Accordingly, Applicants respectfully request withdrawal of the 35 U.S.C. §103(a) rejection regarding claim 29.

Claim 30 stands rejected under 35 U.S.C. § 103(a), as allegedly unpatentable over Rosato, Toshihiko, and Singh, further in view of Adedeji. Applicants respectfully traverse this rejection.

Claim 30 ultimately depends from claim18. As presented above, claim 18 is not obvious over Rosato, Toshihiko, and Singh. Adedeji also fails to teach or suggest a multi-step method of molding disks and also fails to teach or suggest the required radial tilt change value. Based on the teachings of Rosato, Toshihiko, Singh, and Adedeji, one of ordinary skill in the art would not even look to molding parameters as the means to obtain a disk assembly having reduced radial tilt as neither of these references teach or suggest the importance of these parameters to final disk assembly dimensional stability. Accordingly, Applicants respectfully request withdrawal of the 35 U.S.C. §103(a) rejection regarding claim 30.

Reconsideration and withdrawal of this rejection are respectfully requested.

It is believed that the foregoing remarks fully comply with the Office Action and that the claims herein should now be allowable to Applicants. Accordingly, reconsideration and withdrawal of the rejections and allowance of the case are respectfully requested.

If there are any additional charges with respect to this Response or otherwise, please charge them to Deposit Account No. 50-1131.

Respectfully submitted,

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